			sent to the address provided is returned as failed mail, unknown user.	sale
27892	Williamston, NC	Copper Road	The contact information for the BPL operator is incorrect. Email sent to the address provided is returned as failed mail, unknown user.	The domain name CopperRoad.com is listed as being for-sale
28226	Charlotte, NC	Current	There is no model or frequency information listed.	
28277	Charlotte, NC	Current	There is no model or frequency information listed.	
32208	Jacksonville, FL	Jacksonville Electric Authority	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	
32209	Jacksonville, FL	Jacksonville Electric Authority	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	
43402	Bowling Green, OH	Amperion	The contact information for the BPL operator is incorrect. Email sent to the	

			address provided is returned as failed mail, unknown user.	
48813	Charlotte, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007. The BPL database has been inaccurate with respect to this system for over three years and through several reports of the error to the FCC and UTC.
48820	DeWitt, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007. The BPL database has been inaccurate with respect to this system for over three years and through several reports of the error to the FCC and UTC.
48822	Eagle, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007.
48837	Grand Ledge, MI	Utility.net	Although this system appears in the BPL database,	This system was taken out of service in

			the BPL operator has confirmed that the system is no longer in operation.	November 2007
48861	Mulliken, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007
48866	Ovid, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007
48875	Portland, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007
48876	Potterville, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007
48879	St Johns, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed	This system was taken out of service in November 2007

			that the system is no longer in operation.	
48906	Lansing, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007
48917	Lansing, MI	Utility.net	Although this system appears in the BPL database, the BPL operator has confirmed that the system is no longer in operation.	This system was taken out of service in November 2007
63701	Cape Girardeau, MO		The contact information for the BPL operator is incorrect. Email sent to the address provided is returned as failed mail, unknown user.	
63702	Cape Girardeau, MO	Ameren UE	The contact information for the BPL operator is incorrect. Email sent to the address provided is returned as failed mail, unknown user.	
63703	Cape Girardeau, MO	Ameren UE	The contact information for the BPL operator is incorrect. Email sent to the	

			address provided is returned as failed mail, unknown user.
63705	Cape Girardeau, MO	Ameren UE	The contact information for the BPL operator is incorrect. Email sent to the address provided is returned as failed mail, unknown user.
70807	Baton Rouge, LA	PowerGrid	The contact information for the BPL operator is incorrect. Email sent to the address provided is returned as failed mail, unknown user.
70810	Baton Rouge, LA	PowerGrid	The contact information for the BPL operator is incorrect. Email sent to the address provided is returned as failed mail, unknown user.
72064	Hazen, AR	PowerGrid	The contact information for the BPL operator is incorrect. Email sent to the address provided is returned as failed mail, unknown user.
94551	Livermore, CA	The Shpigler	The contact information for

		Group	the BPL operator is not correct. In response to ARRL's inquiry, Shpigler promptly responded, directing ARRL's inquiry to PG&E.	
98847	Peshastin, WA	Chelan PUD	The BPL system is still in the database, although ARRL has confirmed that it is no longer in operation.	

Exhibit B

Exhibit B

THE TECHNICAL COMPONENT OF THE RECORD IN THIS PROCEEDING, AND THE SECOND REPORT AND ORDER

By Ed Hare, W1RFI, Laboratory Manager, ARRL

December 14, 2011

The FCC claims that it is not persuaded by ARRL's technical submissions filed in response to the Further Notice of Proposed Rulemaking; there are "additional" considerations that previously led the FCC to reach different conclusions. In the Second Report and Order, the FCC states that it has not reached different conclusions than it reached in the first Report and Order. (Paragraphs 18, 19)

The ARRL's submissions in response to the Further Notice of Proposed Rule Making and in Written Ex Parte Filings represent a strong record that effectively makes the following points:

1. Contrary to the FCC's claims, the radiated emission limits that apply to carrier-current systems are high. Those limits are approximately 30 dB greater than the current median levels of man-made noise, and as much as 50 dB greater than the minimum noise levels found in today's EMC environment. It is common for a frequency-agile service such as the Amateur Radio Service to select frequencies within its allocated bands that are at those minimum noise levels. Man-made noise also typically varies over time, allowing licensed radio services to select operating times that have lower noise levels. Man-made noise also varies considerably with location, over relatively short distances, allowing licensed radio services that have the ability to select operating locations to choose to operate from locations that have low noise levels.[1]

2. BPL is a broadband emitter with a power-spectral distribution that is uniform over frequency, relative to the typical bandwidth of licensed receive systems operating in its frequency range. This completely eliminates the frequency variation that is typical of most man-made noise. As a result, stations operating in the Amateur Radio Service cannot take advantage of the frequency agility that protects its operators from some man-made noise.

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[1] It is common for operators in the Amateur Radio Service to make very specific choices as to where they will live and operate, based on the ambient noise levels present at a particular location.

3. Access BPL operates continuously over time, as does some in-premise BPL technology (generating idle carriers when the BPL modem is powered on, but not in actual use). This completely eliminates the time variation that is typical of most man-made noise. As a result, stations operating in the Amateur Radio Service cannot use time to protect itself from BPL-caused man-made noise.

4. Contrary to what the FCC claims, BPL *is* a distributed emitter, and although noise near the injection point is several dB stronger than it is up and down the line, the record on quantitative measurements is clear; BPL emissions decay only *slowly* with distance along the line. This is strongly supported by the qualitative record as well, with both FCC and ARRL video recordings documenting that in the areas where BPL is deployed, BPL operates at a level that is many dB stronger than most of the desired signals routinely used in the Amateur Radio Service.

5. Operation of BPL at the current emissions limits will cause strong interference to nearby radio users if BPL is using spectrum that is in use locally. Avoiding the use of any spectrum that is in use locally by notching is the only way that BPL operators can meet their obligation to not cause harmful interference to licensed radio services. In the case of a radio service whose stations do not operate only from a single fixed location (e.g. Amateur, Citizens and the reception of international shortwave broadcast transmissions), it is not possible to address interference after the fact. When an access BPL system is deployed, it will operate over most, if not all, of a large geographical area. If harmful interference occurs over a matter of the days, weeks or months that it would take for BPL operators to address interference to permanent fixed Amateur stations, it has indeed "seriously degraded" the operation of a fixed, mobile or temporary fixed station that was not able to operate over a significant period of time, over a large geographical area. Once that interference has occurred, and not been resolved before it was made moot by relocation of the victim receiver, it cannot be corrected after the fact and the system would be left exactly as it was originally configured, causing the same harmful interference to the next licensed user that tried to operate on those bands in that large geographical area.

FCC claims:

(1) The present rules provide "an effective means of limiting harmful interference" from BPL and "ensure that any instances of harmful interference that may occur can be quickly identified and resolved." The rules are "adequate and appropriate" and additional material does not demonstrate a need to change the rules. (Paragraphs 15, 21, 26, 32, 34, 38).

(2) There is little likelihood that harmful interference would occur from access BPL operation at the current radiated emission limit. (Paragraph 23).

(3) Some operation may occur at distances sufficiently close to lines carrying BPL to make harmful interference possible (Paragraphs 14, 21).

(4) FCC agrees with NTIA that some cases of harmful interference "may be possible" and that the acceptance of a "negligible risk" of interference is justified (14).

FCC position: The current emissions limits will restrict BPL to low levels in comparison to the signals of licensed radio operation (Paragraph 21).

(5) FCC disagrees that recently released material shows the interference potential from BPL to be greater than it anticipated in the Access BPL Order (Paragraph 26).

(6) BPL will be required to cease operation if it causes harmful interference and/or BPL operator must resolve interference if it occurs (Paragraphs 15, 54).

BPL noise levels are 30 to 50 dB higher than the existing, generally accepted levels of man-made noise. The existing man-made noise levels stem primarily from incidental emitters and the conducted noise levels of non-carrier-current unintentional emitters. Not coincidentally, the permitted conducted noise levels from most unintentional emitters is 30 dB lower than the levels that BPL uses in practice (and which presumably represent the level of noise that will result in the radiated emissions limits that BPL must meet). An increase of noise levels of 30 dB or more is neither insignificant nor acceptable. Were it otherwise, conducted emissions limits for all types of devices could be raised by the same 30 to 50 dB. There has never been a serious request from industry to raise the conducted emissions limits because most industry knows that the present levels of man-made noise DO represent a reasonable "acceptable" risk of harmful interference and they *know* that an increase of 30 dB would result in widespread interference instances.

The record does *not* show that BPL noise is "low" with respect to the signal levels used by licensed radio services on HF. Graph after graph of measured "before and after" results show the wide range of desired, licensed signals used on HF and the fact that BPL operating at the FCC limits completely masks all but the strongest of those signals. BPL noise may be somewhat lower than some of the strongest HF signals, but it still degrades the desired signal significantly. It would *not* be acceptable to anyone of their favorite radio station were still audible, but had a clearly audible noise present at all times. This is exactly what happens to the strongest signals on HF with "legal limit" BPL operating nearby. Other weaker signals that would still be quite usable are simply completely obliterated by BPL noise.

The FCC admits that the interference level shown in the FCC video documentation of the Ambient Briarcliff Manor system is unacceptable, yet this unacceptable level is well documented in the majority of the filings in this proceeding.

FCC claims that “BPL systems will be required to cease operation” if harmful interference occurs, but the fact of the matter is that despite a number of repeated complaints about interference at various BPL systems (whether operating pursuant to Experimental[2] authorizations or pursuant to Part 15 rules), the FCC has not once ordered that a system be shut down or notched, despite harmful interference that persisted for many months.

FCC claims that IBEC has implemented systems and resolved interference problems within the framework of existing rules. (Paragraphs 48, 69)

IBEC has *not* operated its systems within the framework of the existing rules. It has implemented systems that were not entered into the BPL database (claiming an administrative oversight); it has implemented systems that did not (and still do not) meet the FCC emissions limits; it has certificated equipment (which were supposed to be tested as required at the maximum operating level) that operates at levels as much as 40 dB higher when deployed in the field than permitted by the Part 15 rules; it made material misrepresentations to ARRL and to local radio amateurs about its intent to use full-time notching of the amateur bands, demonstrating the same to ARRL and others locally, and then did not implement that notching as it had promised. The misrepresentation was repeated and persisted for over a year in the FCC database. IBEC has since made half-hearted attempts at protecting *some* stations operating in the Amateur Radio Service, although those amateurs report that the corrections they have made have still left degraded noise levels and that somehow, the interference keeps recurring, presumably as new customers are added, necessitating successive rounds of complaints. IBEC has also told at least one complainant that reported interference to his mobile HF station (which had been operated for years prior to the BPL installation) that there is nothing IBEC can or will do to protect his mobile operation, despite the fact that the minimal protection level of 20 dB below the emissions limits was not applied in the communities in which the victim amateur was previously able to regularly conduct HF mobile operations.

IBEC is *not* a good example for compliance with the rules. To the contrary, although the FCC makes an attempt to justify each individual component to its present rules, few of the interference mitigation proposals apply to Amateur Radio stations. Those that do, taken *in toto*, are easily subverted by the BPL operator, as was seen in the case of IBEC. The rules are therefore a failure. Were IBEC the only bad example, one could argue that the rules are still valid, but one operator is not following them. The overall record shows that BPL systems consistently operate above the limits, using equipment that was ostensibly certified to operate at or below those limits. These operators have an abysmal track record of responding to interference reports with denials and, in some cases, responses that appear to be entirely fabricated.

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[2] The premise in the 2nd Report and Order that because some of the systems for which complaints were filed were Experimental stations the complaints do not have applicability to the existing rules because those systems did not have the protection of the existing rules is a red herring. The emissions levels of the Experimental systems were the same as Part 15 and extrapolation was presumably done the same way. Experimental operation has a provision about ceasing operation that is *stronger* than Part 15. The experiences with the early Experimental systems are completely applicable to the present rulemaking and must be considered.

FCC claims that ARRL's request for -35 dB notch depth is 1/5000th of the levels permitted for other devices (Paragraph 25).

This statement misinterprets the existing rules, largely by omission. The FCC's statement is true with respect to the levels permitted for other carrier-current devices, but BPL systems are the *only* carrier-current devices that operate over such a wide swath of spectrum. Access BPL systems are the *only* carrier-current devices that are part of systems that can be as large as an entire State. The vast majority of "other devices" that are regulated by existing radiated emission limits are non-carrier-current unintentional emitters. These devices are governed by the conducted-emissions limits in Part 15 rules, and the levels that ARRL is seeking for notch depth correspond very well to the current Part 15 conducted emissions limits. It would be more accurate to say that ARRL is seeking notch-depth protection that is equal to the conducted emissions levels for other devices.

This demonstrates the wide difference between the present rules for non-carrier-current devices and carrier-current devices such as BPL. If one presumes that the operating level of various BPL modems, identified by the manufacturers as operating at levels plus and minus a few dB from -56 dBm/Hz correspond to the radiated emissions limits, then BPL operating at those levels is operating at a level that causes one BPL modem to make as much noise as 1000 other unintentional emitters.

At HF, ARRL has measured BPL systems operating 20 dB or more above the carrier-current limits. In those cases, one BPL modem was making as much noise as 100,000 other unintentional emitters, again over a very, very broad area.

FCC's claim that the video interference shown from ARRL's videotape of Briarcliff Manor is not acceptable and would not be permissible under the Part 15 rules (Paragraph 32).

BPL operating at the radiated emission limit does cause harmful interference on any spectrum that is in use nearby, especially to stations operating in the Amateur Radio Service.

FCC conceded this in the 2nd R&O when it claimed that the video evidence gathered by FCC staff in Briarcliff Manor, NY did indeed show levels of noise that represented unacceptable interference. FCC did not make measurements of the radiated field strength at the locations shown in the video, but ARRL did. Although there were a number of places in the Ambient Briarcliff Manor system that were operated above the FCC limits, the emission levels on the majority of the street where that video was made were approximately at the Part 15 radiated emission limits. The same thing is seen in the ARRL videos from that system, as well as ARRL staff experience in Agawam, MA; Shelton, CT; Briarcliff Manor, NY; Manassas, VA; Allentown, PA; Rochester, MN; Rock Hill, NC; Charlotte, NC; Penn Yan, NY; Bowling Green, OH; Cottonwood, AZ; San Diego, CA; Miami, FL; Lovingston, VA; Cedar Rapids, IA; Cape Girardeau, MO; Lee's Summit, MO and Houston, TX. Video documentation driving down the road was not made by ARRL at each of these locations, but unbiased witnesses of the effect of BPL on local HF communications have without exception reached the same conclusion – the level of interference that the FCC deemed to be unacceptable from the Ambient system in Briarcliff Manor NY was seen in *all* of the BPL systems cited above, operating at levels that approximately represent the current BPL limits. There was nothing unique at all about the FCC Briarcliff Manor video – it shows what BPL systems do. The exceptions to this experience with respect to Amateur Radio were seen in the systems that notched the amateur bands, such as the Current Technologies systems in Cincinnati and other locations, the Ambient system in San Diego and the systems that, often after being confronted with serious interference problems, chose to implement full-time notching for the amateur bands.

FCC claim that the ITU-R SM.1879 recommendation of 0.5 dB increase was not justified (Paragraph 44).

While the FCC was quick to embrace an IEEE standard which the most authoritative IEEE Society rejected out of hand, the FCC has inexplicably rejected a directly applicable and universally acknowledged ITU-R Recommendation. The level of 0.5 dB protection that is in this ITU-R Recommendation is not unique to the Amateur Radio Service. It is a protection level that is found across a wide range of internationally allocated services and serves as the basis on which international regulations are crafted for those services. ITU-R Recommendations are not justified; they serve as the authoritative basis on which domestic regulations, and justifications for them, are built. The FCC's dismissal of this ITU-R Recommendation as unjustified demonstrates that its focus is on a desired outcome.

FCC claim that it recognized the critical nature of aeronautical service and the free space propagation from power lines to overhead aircraft (Paragraph 33).

FCC is correct in holding that BPL emissions upward from power lines are greater than those along the ground. Each premise outlined in paragraph 33 applies equally well to any radio service whose operators routinely use antennas located at heights greater than the power lines.

FCC disagrees that resolving interference is difficult because the BPL database will make resolution of interference easy (Paragraph 55).

Resolution of BPL interference has never been easy. In case after case, even the current cases involving IBEC, the BPL industry has consistently avoided having to address harmful interference after it has been reported. Amateurs have had to make repeated measurements, made repeated mitigation requests, and filed formal complaints with the FCC, but in most cases, the resolution (if any) of the interference was only partial or temporary at best. The vast majority of interference problems were resolved when the BPL system shut down for financial or technical reasons, or implemented full-time Amateur band notching.

FCC argues that the radiated emission limit in the Access BPL Order will increase noise only for a short distance from power lines (15 to 400 meters). ARRL allegations that *ex ante* prevention is required were considered and rejected because FCC data showed that the area of interference was only "close to and along" power lines (Paragraphs 50, 51, 54).

If the NTIA Phase I report is correct (and FCC has never indicated that it is wrong), then a significant (nearly 100%) likelihood of harmful interference exists within 400 meters of power lines carrying BPL signals. Within that area, most Amateur Radio receivers subject to BPL interference are potential victims. If BPL were ubiquitously deployed, at least 95% of amateur stations are "close to" power lines, and thus although interference would not occur at all locations where BPL is deployed, it would occur at the vast majority of locations where amateur stations are present. For any radio service that can and does have operation from unspecificed, sometimes temporary locations, the track record of most interference taking weeks to months to resolve simply cannot be used to address interference to mobile and portable amateur operation. If BPL interference were like other interference sources, and very limited in geographical scope, one could reasonably take the position that those that choose mobile or temporary portable operation locations need to consider the presence of local noise in making their choices. But for access BPL, where interference on several or all HF amateur bands would be present over a very large geographical area representing an electric utility's service area, that choice simply does not exist. The only way to avoid causing harmful interference to radio services for which it is not possible to determine in advance the locations of licensed operators is to avoid the use of spectrum that they are licensed to use.

The FCC Decision to Reaffirm the 40 dB/decade of distance Extrapolation factor.

FCC positions:

1. **FCC rules on signal decay extrapolation are based on the "successful past performance" of existing standards (Paragraph 35)**
2. **40 dB/decade is a successful and existing standard practice**

ARRL, other commenters and the large number of standards and ITU documents show clearly that a straight 40 dB/decade distance extrapolation is not correct. These studies, ARRL comments and any industry standard that did not support the retention of the existing 40 dB/decade extrapolation below 30 MHz – were all discounted by the FCC. The one IEEE BPL electromagnetic-compatibility (EMC) standard that *did* support what the FCC wanted to do, which was to allow the measurement of 4 data points near the BPL system to determine a "site specific" extrapolation, was readily embraced by the FCC, despite major technical flaws. This is inexplicable in the face of the fact that the IEEE EMC Society, the IEEE sponsorship with the most direct experience and knowledge of the subject area of the standard, rejected the standard and withdrew as a sponsor on technical grounds, *citing the very portion of the standard that the FCC adopted into rules as a major area that was technically flawed.*

ARRL placed into the record an *ex parte* paper that used several of the NTIA antenna models from the NTIA report and used NEC antenna modeling to predict the field strength at the points along the line that the FCC rules direct shall be measured. The NEC modeling showed that if one were to make measurements exactly as the FCC rules and proposed method would require, the calculated value of "extrapolation" varied wildly.

The FCC inexplicably justifies this variability as sufficient cause to make measurements of a mere 4 points away from overhead power lines, even though the modeling of antenna models uses to justify other parts of the rules shows that there *is* no "site-specific" value of extrapolation, as the results vary wildly at a particular site, from location along the line to location along the line, and by frequency. The ARRL and EMC Society were correct; the method is flawed and should not be used to determine extrapolation. Even the standard is crystal clear in this regard, stating: *This relationship is unique to a specific measurement frequency and location along the overhead line (see Figure A.1).*

The FCC is correct that the ability to make measurements of extrapolation exists in the present rules and that method can and does apply reasonably well to physically small radiators, but radiators that are large in terms of wavelength exhibit complex patterns of emissions, demonstrated strongly by ARRL filings placed into the record in this proceeding, with peaks, valleys and fields that do not decay gracefully with distance. In most cases, the pattern is skewed such that measurements made perpendicular to the radiating line are being made into and out of peaks and nulls, giving results that are very unreliable. This was shown in ARRL's ex parte filings, yet the point was not discussed in any significant way in the 2nd Report and Order.

ARRL, however, does believe that the approach described in Std. 1775 could have some merit, but only if measurements are made along the line for each measurement distance from the line, and the maximum value at each distance from the line for each frequency is used for the calculation. Although this methodology is not perfect, it probably does represent the best that can be done in a very complex environment and it would yield reasonably acceptable results.

ARRL has placed into the record competent study after study and even international regulation that supports its positions, yet FCC dismisses these in favor of vague BPL-industry statements, which FCC simply accepts as fact because they support a politically determined outcome.

The FCC's positions can only be justified by its by proclaiming that the upper 20% of the noise made by BPL is "localized hot spots," and conveniently ignoring the maximum noise levels produced near BPL systems, when in reality, in the models used for the calculations, those so-called "hot spots" are not the results of some unusual conflux of out-of-the-ordinary factors, but come from simple models that represent the median way that power lines will radiate. The "hot spots" that occur with precise regularity in the standing wave pattern developed near a large radiator are the very essence of what the FCC is saying it is trying to determine by extrapolation – the way that a measurement of the maximum emissions at one distance corresponds to the maximum emission at another distance. This simply cannot be accomplished by basing a distance extrapolation factor that is based on finding the point of maximum emissions at a close distance, then using an extrapolation factor that is only accurate if the *actual* maximum emission at a greater distance is ignored by discarding the upper 20% of the data points from the wildly variable peaks and valleys that are seen in the standing wave patterns of field strength found near emitters whose dimensions are large in terms of wavelength.

One need look no farther than the language of the Part 15 rules that define extrapolation. Sec. 15.31(f)(2) describes the extrapolation of field strength versus distance for frequencies below 30 MHz, indicating that the method shall be used "pending the development of an appropriate measurement procedure for measurements below 30 MHz." It is clear that that the FCC intended that 40 dB/decade be a placeholder, not a final decision, yet in every instance since, the FCC has rejected any and all attempts to develop and "appropriate measurement procedure" unless it agrees with the FCC's decision to liberally allow the use of 40 dB/decade as an extrapolation factor. This is neither a scientifically appropriate or balanced way to foster the development of an appropriate procedure.

To ARRL's knowledge, Sec. 15.31(f)(2) of the FCC Part 15 rules, and the rules of a few other nations that typically adopt FCC rules to ensure good harmonization of regulation, is the *only* place where 40 dB/decade is applied as an extrapolation factor. In contrast to the FCC's oversimplified placeholder, in the numerous industry standards that ARRL described for the record in its ex parte filings a $\lambda/2\pi$ breakpoint is used to delineate the near and far field regions and extrapolation factors of 40 dB/decade are typically seen in these standards within the near-field boundary and 20 dB/decade are seen beyond the breakpoint. These standards represent the scientific basis on which a good extrapolation factor could be based, not a placeholder in the rules that is applied to only a handful of device types, not the much larger number of unintentional emitters regulated by other parts of Part 15.

One need look no farther than the existing BPL systems to know that the existing practice is wrong. ARRL has made measurements in a number of BPL systems and in the vast majority of these systems, the systems that are certificated under existing rules – and the existing extrapolation factors – are seen to be operating significantly above the FCC emissions limits. This excess is not a matter of a few dB in a few locations, which could be explained reasonably by site-to-site variations and hot spots. ARRL has seen BPL systems that are operating in practice as much as 25 dB above the FCC limits below 30 MHz, and as much as 40 dB over the limits above 30 MHz[3]. The rules and FCC test methods require that BPL systems be tested for certification at their maximum possible operating levels. According the certification test data, this was done, but when deployed, the systems are capable of and are actually operated at levels that are grossly exceeding the limits. This simply could not happen if the existing rules and practices were correct.

This problem of grossly exceeding the limits is not an old problem since resolved by the industry. In November 2011, ARRL made repeat measurements of the emissions levels in the

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[3] ARRL has filed formal complaints with the FCC about several BPL systems that exceed the emissions limits. The FCC has not acted on those complaints in over a year, thus preventing any meaningful examination of the "track record" of the use of 40 dB/decade in the present rules.

BPL system operated by IBEC in and near Lovingston, VA. ARRL found that most of the locations it had tested earlier were still operating grossly over the FCC limits[4].

ARRL also measured the BPL system in and near Mars Hill, NC, operated by the French Broad EMC. This system was also found to be operating at levels grossly exceeding the FCC emissions limits. The system also was not protecting the prohibited bands at all.

Summary

In looking at the totality of the existing rules and the unresolved problems with deployment in the field, the FCC attempts to justify the individual portions of the rules notwithstanding, it is clear that in total, the rules do not provide a good foundation on which BPL technology can be built. When deployed without notching of the amateur bands, interference has been seen in system after system, over a time span of eight years. Without universal notching of the amateur bands, there is no practical way to protect fixed, mobile and temporary portable amateur operation, which is ubiquitous. When certificated under the present rules, BPL systems as deployed grossly exceed the FCC emissions limits *in situ*.

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[4] ARRL had also reported that the required notching of the bands prohibited to BPL was not in place. In its November 2011 testing, ARRL noted that, for the most part, IBEC and CVEC's violation of the prohibited-bands rules has been corrected. However, with the system operating at levels significantly over the emissions limits, the protection is also significantly above the -20 dB notch depth required by the rules.